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examination of the brain of an adult male Eskimo, a member of the party of six brought to New York in 1896 by Lieutenant Peary. In size and complexity of conformation the cerebrum indicated a degree of development equal to that of the average white person. The parts of the encephalon did not have the relative proportions that exist in the white brain. The frontal lobes were about equal in size to those of whites, while the portions posterior to the fissure of Rolando were considerably larger. The paper is illustrated by seven excellent plates.

In a reprint from the *Archives of Neurology and Psychopathology*, Vol. I, No. 4, 1898, we find a discussion by Dr. Hrdlička of the "Dimensions of the Normal Pituitary Fossa, or Sella Turcica, in the White and Negro Races, an anatomical study of fifty-seven normal skulls of white and sixteen normal skulls of colored individuals." Since marked enlargements of the pituitary body are of a pathogenic nature, it is considered desirable to determine the normal dimensions and the range of variation in its size. This can best be accomplished by measuring the pituitary fossa. The length, width, and depth of the fossa were measured, and a module derived similar to the skull module of Schmidt. The relation to the total size of the skull was obtained by multiplying this module by 1000 and dividing the result by the circumference of the skull, expressed in centimeters.

F. R.

GENERAL BIOLOGY.

Protoplasmic Streamings. — Martin Heidenhain[1] adds some very interesting observations to our knowledge of the remarkable phenomena of currents seen in so many vegetable cells. In the elongated cells of the hairs in the flowers of the pumpkin he studied especially the movements of the granules. In favorable specimens there are apparent gliding movements of the granules, even when the protoplasm seems quiet. Frequently, however, the protoplasm is actively moving in masses, producing those constant changes in the form and arrangement of the strands that join the central, nucleated region with the protoplasm lining the cell wall, that have been described by other observers. But even when there is, apparently, temporary rest of the protoplasm, the granules may move along as if carried by a current; that they are not in a current of protoplasm seems demonstrated, the author thinks, by the fact that granules pass in different directions close to one another, and one may even advance against the "stream" or crowd of others going in an opposite direction. These same facts strengthen the author's belief that protoplasm is not a liquid.

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[1] Einiges über die sogenannten Protoplasma-Strömungen, *Sitz.-Ber. Phys.-Med. Gesell. Wurzburg*, 1898.

The author explains these apparently automatic movements of the granules (and of the chlorophyll bodies) as due to contractility, not resident in the granule but in the adjacent protoplasm. He adopts the inotogmata hypothesis of Engelmann, and conceives fibrils made of living particles *temporarily* joined. Along those transitory fibrils waves of contraction proceed, and thus the adjacent, inert, dead granules are, in some way, forced along. The granules are moved along in temporary routes made by the contractile fibrils.

The basis for the assumption of such hypothetical fibrils is: (1) the existence of visible fibrils, (2) certain changes in optical value, and (3) waves of contraction seen under the microscope. The author agrees with Bütschli that the structure of the protoplasm in these cells is that of a foam; he sees striations and cross-connections in masses where shape and arrangement change in such wise that the existence of a foam seems to underlie the above appearances.

But in the structure lines, lamellæ he thinks them, he also sees long and short fibrils which are sometimes stationary, sometimes moving along like granules. These curious fibrils are soft and easily break up; they are, he maintains, in the walls of the alveoli, that is, between the vesicles of the foam structure. He supposes these fibrils are the remnants, or ruins, of hypothetical contractile lines of protoplasm which are no longer functional.

The changes in optical value spoken of are passages from bright to dark which are seen in the lamellæ, and interpreted as being coexistent with changes in the contractile material.

The waves of contraction seen are bendings in the usually straight lamellæ, or striations.

Whatever the nature of these remarkable interalveolar fibrils, their existence harmonizes the divergent views of Flemming and of Bütschli to the extent that a foam structure is found with actual fibrils between the alveoli; in this and in several other points the author's observations confirm some of the facts recorded for various animal cells by G. F. Andrews[1] and open a most suggestive field of research upon oft-tried material.

E. A. A.

[1] *The Living Substance.* Boston, Ginn & Company, 1897.